



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
-----------------	-------------	----------------------	---------------------	------------------

09/910,959

07/24/2001

Karl-Anton Starz

33766W035

3644

13322 UB

7590

10/06/2003

EXAMINER

CANTELMO, GREGG

SMITH, GAMBRELL & RUSSELL, LLP  
Suite 800  
1850 M Street, N.W.  
Washington, DC 20036

ART UNIT

PAPER NUMBER

1745

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/910,959

Applicant(s)

STARZ ET AL.

Examiner

Gregg Cantelmo

Art Unit

1745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 23 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-23 is/are pending in the application.
- 4a) Of the above claim(s) 11-14, 16-21 and 23 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-10, 15 and 22 is/are rejected.
- 7) ☒ Claim(s) 5 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 & 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other:

## DETAILED ACTION

### *Election/Restrictions*

1. Applicant has elected claims 1-10, 15 and 22 with traverse. Response to Applicant's traversals is provided in item 2.
2. Applicant's election with traverse of Group I, claims 1-10 in Paper No. 9 is acknowledged. The traversal is on the ground(s) that there is no burdensome search on the Examiner. This is not found persuasive.

The product of claims 1-10 does not require a search with respect to the method of making the product as recited in claims 11-12. Applicant has failed to provide convincing evidence that the product of claims 1-10 is only obtainable from the process recited in claims 11-12. Restriction between a product and process of making a product is valid in the absence of clear and undeniable evidence that the product of claims 1-10 is only derived from the process of claim 11-12.

Applicant's argument does not sufficiently overcome the restriction since it merely argues lack of burdensome search and does not address the reasons for restriction set forth in item 2 of the previous office action. Furthermore it is evident that since the product can be made by other processes, the search for claims 1-10 is in fact distinct from the process of claims 11-12 as evident from the different classification of both inventions. Therefore Applicant's arguments to the traversal of the restriction requirement between claims 1-10 and claims 11-12 is not persuasive.

Applicant also argues that there is no apparent burdensome search between Groups I and III. The Examiner is not persuaded. As set forth in the previous office action, the groups are related to product (Group I) and process of using the product (Group III). As is apparent from Applicant's own disclosure, the product can be used in a number of processes each separate from the others. As presented in the previous office action, the product can additionally be used in a number of additional processes and in other devices such as gas sensors and water electrolysis devices.

Therefore Applicant's arguments to the traversal of the restriction requirement between claims 1-10 and claims 18-21 is not persuasive.

The requirement is still deemed proper and is therefore made FINAL.

Applicant's election with traverse of Species B-3 in Paper No. 9 is acknowledged. The traversal is on the ground(s) that the Examiner has failed to establish a prima facie case for species restriction. This is not found persuasive because applicant's traversal on the ground that the species are not patentably distinct, fails to comply with a submittal evidence, identification such evidence now of record showing the species to be obvious variants, or clearly admission on the record that this is the case. Applicant has failed to comply with this requirement, therefore the species election stands.

The requirement is still deemed proper and is therefore made FINAL.

***Priority***

3. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

***Information Disclosure Statement***

4. The information disclosure statements filed September 24, 2001 and October 17, 2001 have been placed in the application file and the information referred to therein has been considered as to the merits.
5. Note that items AL and AM on the IDS filed October 17, 2001 have been crossed out since they were already cited on the previous IDS filed September 24, 2001.
6. The listing of references in the specification is not a proper information disclosure statement. 37 CFR 1.98(b) requires a list of all patents, publications, or other information submitted for consideration by the Office, and MPEP § 609 A(1) states, "the list may not be incorporated into the specification but must be submitted in a separate paper." Therefore, unless the references have been cited by the examiner on form PTO-892, they have not been considered.

For example, DE 197 45 904 A1 cited on page 3, line 28 of the specification is not listed on either of the information disclosure statements filed September 24, 2001 and October 17, 2001.

***Claim Objections***

7. Claim 22 is objected to because of the following informalities: the units of "mg Pt/cm<sup>2</sup>" should be --mg/cm<sup>2</sup> Pt--. Appropriate correction is required.

***Claim Rejections - 35 USC § 112***

8. The following is a quotation of the second paragraph of 35 U.S.C. 112:

Art Unit: 1745

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. Claims 15 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1 is drawn to the claimed *combination* of the nanoparticles and the polysaccharide.

Claims 15 and 22 are drawn to the combination of the product of claim 1 in a membrane electrode assembly. However it is unclear specifically if the combination in claims 15 and 22 require all of the constituents of the intermediate product of claim 1, in particular of the presence of the polysaccharide. The exact scope of claims 15 and 22 is not explicitly clear with respect to which components of the product of claim 1 are in fact present in the combination. While the Examiner has interpreted the claims as set forth in the 102 rejection of DE 197 54 304 A1 below, it is requested that Applicant further clarify the extent of the scope of claims 15 and 22 and acknowledge whether the Examiner's interpretation is accurate.

#### ***Claim Interpretation***

10. While claims 1-6, 15 and 22 recite the term "nanoparticles" the claim fails to recite upper and lower bounds of the term. Particles having a diameter of 10 nanometers are considered to be nanoparticles and in the absence of clear definition of the size of the particles, particles having a diameter of, for example, 100 microns, is held to be 100,000 nanometers and still deemed to be a nanoparticle.

This interpretation is not unreasonable in light of the fact that applicant liberally uses the term to refer to sub-nanometer sizes. See claim 7 wherein 0.1 nm is held to be a nanoparticle as opposed to say a sub-nanoparticle.

Given the apparent liberal use of the term nanoparticle to include sizes which are out of the nanometer range, the Examiner finds it reasonable to apply this to the values greater than nanoscale diameters, such as microns.

Note this does not apply to claims 7-10 wherein claim 7 defines the nanoparticle diameters to be within a range.

***Claim Rejections - 35 USC § 102***

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1-3 and 6-10 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 5,421,989 (Stamp).

Stamp discloses noble metal (col. 8, ll. 44-50) nanoparticles (col. 9, ll. 16-20) embedded in an aqueous solution of a temporary polysaccharide stabilizer (paragraph bridging columns 8 and 9 as applied to claim 1).

The term “can be” in claims 2 and 3 is a term which does not positively require the subsequent process limitations (pyrolysis of claim 2 and acid/alkali bond breaking of claim 3). The prior art employs gum arabic as a temporary stabilizer (col. 8, line 64).

Art Unit: 1745

Since this is the same material exemplified within the instant application, there is a reasonable expectation that the prior art gum arabic stabilizer "can be" removed by pyrolysis at temperatures up to 250° C (claim 2) and "can be" removed by breaking glycosidic bonds of the gum arabic in the presence of acids or alkalis (claim 3).

The noble metals contain at least one of Pt, Pd, Rh, Ir, Ru, Os, Au, Ag (col. 8, ll. 44-50). The optional additional elements are not positively required (as applied to claim 6).

The particle sizes range from about 50 Angstroms to 2,000 Angstroms (col. 9, ll. 16-20). This is equivalent in nanometers to be 5 nm to 200 nm. 5 nm being a specific data point within the range of instant claim 7 and further the range of Stamp encompasses the instant claimed range (as applied to claim 7).

The polysaccharide is gum arabic (col. 8, line 64 as applied to claim 8).

The concentration of particles in the aqueous solution is 50 mg/L to 1000 mg/L (col. 8, ll. 54-59 as applied to claim 9).

The weight ratio of the noble metal to the stabilizer is anywhere from about 3:1 to 1:100 and especially from 1:1: to about 1:10 (col. 9, ll. 8-11 as applied to claim 10).

13. Claims 1-4, 6, 7 and 9 are rejected under 35 U.S.C. 102(b) as being anticipated by U.S. patent No. 4,774,760 (Molday).

Molday discloses a product comprising: noble metal particles embedded in an aqueous solution of a temporary polysaccharide stabilizer (abstract and col. 4, ll. 4-8 as applied to claim 1).



Art Unit: 1745

The term "can be" in claims 2 and 3 is a term which does not positively require the subsequent process limitations (pyrolysis of claim 2 and acid/alkali bond breaking of claim 3). Since this is the same material exemplified within the instant application, there is a reasonable expectation that the prior art polysaccharide stabilizers "can be" removed by pyrolysis at temperatures up to 250° C (claim 2) and "can be" removed by breaking glycosidic bonds of the gum arabic in the presence of acids or alkalis (claim 3).

The pH is maintained at about 8 (col. 7, ll. 10-15 as applied to claim 4).

The noble metals contain at least one of Pt, Au, and Ag (abstract). The optional additional elements are not positively required (as applied to claim 6).

The particles range from 2-200 nm (col. 4, ll. 4-8 as applied to claim 7).

The concentration is 10 g per 50 mL of solution (col. 5, ll. 15-17) which converts to 200 g/L (as applied to claim 9).

14. Claims 15 and 22 are rejected under 35 U.S.C. 102(b) as being anticipated by DE 197 54 304 A1 (DE '304).

Claim 15 appears to only require the presence of nanoparticles and not the polysaccharide. The polysaccharide used in the process of making the nanoparticles and claim 1 being drawn to the intermediate combination of the noble metal and polysaccharide temporary stabilizer. The temporary stabilizer is not disclosed as being present in the MEA and the product of claim 15 is interpreted in terms of the positive elements present in the product and not the intermediate composition to obtain the nanoparticles.

"[E]ven though product-by-process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." In re Thorpe, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985) (citations omitted).

"The Patent Office bears a lesser burden of proof in making out a case of prima facie obviousness for product-by-process claims because of their peculiar nature" than when a product is claimed in the conventional fashion. In re Fessmann, 489 F.2d 742, 744, 180 USPQ 324, 326 (CCPA 1974). Once the Examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to applicant to come forward with evidence establishing an unobvious difference between the claimed product and the prior art product. In re Marosi, 710 F.2d 798, 802, 218 USPQ 289, 292 (Fed. Cir. 1983). Ex parte Gray, 10 USPQ2d 1922 (Bd. Pat. App. & Inter. 1989). See MPEP section 2113.

In that respect, DE '304 discloses a MEA comprising noble metal nanoparticles (abstract and page 2, ll. 30-31 as applied to claim 15).

The loading is 0.35 mg/cm<sup>2</sup> of Pt (page 3, ll. 25-27 as applied to claim 22).

***Allowable Subject Matter***

Art Unit: 1745

15. Claim 5 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

16. The following is a statement of reasons for the indication of allowable subject matter: none of the prior art of record appear to teach, suggest or render obvious the noble metal or noble metal/base metal nanoparticles embedded in an aqueous solution of a temporary stabilizer which is a polysaccharide wherein the solution has a total chlorine concentration of less than 100 ppm.

Stamp teaches of the presence of halides in the composition for the purposes of improving electrodeposition. Thus there is no teaching or suggestion in Stamp to control the chlorine concentration to be less than 100 ppm and one of ordinary skill in the art would not have been drawn to such a conclusion given the fact that Stamp in fact teaches of the presence of chlorine in excess of 100 ppm.

The presence of chlorine tends to lead to corrosion of the catalyst components and the catalyst further has reduced resistance to aging (page 4, ll. 2-6 of the instant application). Thus there is a significance to the reduced chlorine content as recited in claim 5, such a teaching not readily taught, suggested or obvious over the prior art of record.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregg Cantelmo whose telephone number is (703) 305-

Art Unit: 1745

0635. The examiner can normally be reached on Monday through Thursday from 8:00 a.m. to 5:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan, can be reached on (703) 308-2383. FAX communications should be sent to the appropriate FAX number: (703) 872-9311 for After Final Responses only; (703) 872-9310 for all other responses. FAXES received after 4 p.m. will not be processed until the following business day. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

Gregg Cantelmo  
Patent Examiner  
Art Unit 1745

gc

A handwritten signature in cursive script, appearing to read "Gregg Cantelmo", written in black ink.

September 27, 2003